REMARKS

Reconsideration and allowance of the present application are respectfully requested.

The specification has been amended as shown above to correct a clerical error, as would be apparent to a person of ordinary skill in the art, in view of the prior language in the noted paragraph which states that there is no perlite in the product and based upon the reference to Example 1 which describes a solidified corn starch containing product.

Claims 15-50, 52-59, 61-169 and 171-202 are pending in this application. Claims 1-14, 51, 60 and 199 have been cancelled. Claims 35, 50, 59, 148 and 186 have been amended. Claims 201 and 202 have been newly added.

Claims 35 and 50 have been amended by essentially incorporating the subject matter of claim 51. Claim 59 has been amended by essentially incorporating the subject matter of claim 60. Claim 148 has been amended as supporting in the present specification, including at page 16, lines 1-6. Claim 185 has been corrected to delete a redundant step (i.e. "blending" and "mixing"). Claim 196, which depends on claim 185, has accordingly been amended for proper antecedent basis. Dependent claim 186 has been amended to correct a clerical error stating the base claim number. Claim 201 has been added based upon claims 148 and 170, (and as supported in the present specification, including at page 23, line 21 to page 24, line 11). Claim 202 has been added based upon claims 35, 36, 42, 43, 44 and 45.

No new features, previously unconsidered by the Examiner, have been added to the claims.

The applicants respectfully traverse the rejection of claims 1-200 under 35 USC 103(a) in view of Pierce and Burkett. The cited references do not make the presently claimed invention to be obvious.

Pierce discloses materials (and methods for making same), for assisting plant growth including agriculturally active materials suspended in a holding material, which is coated onto and impregnated into the microscopically irregular and porous surfaces of expanded perlite particles, whereby the active and holding materials are retained on the perlite particles, enabling controlled release of the active materials to the soil at a controlled rate (see column 1, lines 9-22 of reference).

Pierce's product is individual coated perlite particles. Such particles may be very small to adhere to plants upon which they are dusted (see column 11, lines 9-10) and slightly larger for other applications (see column 11, lines 11-17). The product being individual coated perlite particles is further supported by Pierce's description of the manufacturing process, which shows that larger particles are deposited in storage chambers as disclosed at column 13, line 44 to column 14, line 9 and disclosed at column 16, lines 17-35. As taught at column 16, lines 34 -39, during production of larger coated particles, fine coated particles are conveyed by hot air to a cyclone so that the fines may be dropped into a device for compressing the coated fine particles into tablets or pellets. By an incidentally described and completely separate process, inert, carrier expanded perlite particles may be mixed with holding material and active

material and this mixture is formed into tablets or pellets (see column 16, lines 59-54). While virtually nothing is described about this separate process, the expanded perlite particles are not coated (i.e., they are "inert") and appear to simply provide structural support to the formed tablets or pellets of mixed holding material and active material.

In contrast to the product of Pierce, the product of the presently claimed invention is a controlled release agricultural absorbent based product that in almost all embodiments, includes particles of an absorbent material containing capillaries/voids, which is impregnated with an agriculturally beneficial material (i.e., fertilizers, insecticides, herbicides and/or fungicides) alone or mixed with an interspatial blocker material, with the particles of absorbent material being agglomerated into granules.

Significantly, the presently claimed product is not individual particles, but is an agglomeration of individual particles of impregnated absorbent, into granules. As disclosed in the present application, "...each granule is made up of a multiplicity of perlite particles..." (see page 26, lines 14-15 (and other disclosures in present specification)). Thus, the product is granules of agglomerated individual impregnated particles. Excess agriculturally beneficial material with or without interspatial blocker material on the outside of the particles helps the individual impregnated particles to adhere into granules.

The use of granules of agglomerated impregnated particles, rather than individual particles provides important benefits to the controlled release properties of the presently claimed invention. This is because once applied to the soil, or plant, etc., the granule must first be weakened by water, e.g. soil moisture, rain etc., before gradually

falling apart and releasing individual impregnated particles of absorbent. Once more of the individual impregnated particles are exposed to water, then the agriculturally beneficial material within the particles may slowly (or in a controlled fashion) leach out to impart its benefit (see for example, page 26, lines 17-24).

Pierce does not disclose or suggest granules of agglomerated, impregnated absorbent particles.

The teachings of Burkett do not remedy the deficiencies of Pierce.

Burkett discloses the use of expanded perlite particles as a vehicle or carrier for fertilizers wherein the pores of the perlite particles absorb and retain fertilizer chemicals, so that upon application to the soil, the chemicals will slowly and continuously dissolve from the particles into the soil (see column 2, lines 18-34). The production of expanded perlite particles is described at column 2, lines 58-71. The expanded perlite absorbs a solution of fertilizer chemicals and the perlite is dried to leave the chemical salts within the cells of the perlite (see column 3, lines 2-18) and thus yield dried, active perlite particles as a product.

In another embodiment, the "fine fraction" of the dried perlite particles is "fed to a composting vat" wherein compost of organic material is added, mixed and this mixture is sent to a pelletizer or granulating machine (see column 3, lines 55-63 and lines 18-22). This compost product of Burkett does not relate to, nor is in any way contemplated by the presently claimed invention.

As discussed above with respect to Pierce, the presently claimed product is not individual particles, but is an agglomeration of individual particles of impregnated

absorbent, into granules. Burkett teaches a product of individual particles of absorbed perlite and not an agglomeration of individual particles into granules. The granules of the presently claimed invention provide the additional controlled release property discussed above.

Neither Pierce nor Burkett disclose or suggest the granules of agglomerated, impregnated absorbent particles of the presently claimed invention, as for example recited in presently considered independent claims 15, 35, 50, 59 and 69.

Another claimed embodiment of the present invention, as recited for example in independent claims 63 and 69, is similar to the above discussed controlled release agricultural absorbent based product, however, the absorbent material is exfoliated particles of perlite. Exfoliated perlite particles are expanded perlite particles which have undergone additional conditioning pursuant to a new and unobvious process of the presently claimed invention. In this process, particles of expanded perlite are heated with water to transform the water within the particles of expanded perlite to steam sufficient to rupture the outer surface of the particles of expanded perlite (see page 23, line 19 to page 24, line 8 of present specification). The result provides increased rupture and exfoliation of the outer shell of the expanded perlite particles as the absorbed water expands into steam at atmospheric pressure (see page 24, lines 8-11 of specification). The exfoliated particles of perlite are more open and have greater capillary/void volume than normal expanded perlite, enabling much greater impregnation of an agriculturally beneficial material and interspatial blocker (see page 25, lines 5-16 of specification).

The significant differences between normal expanded perlite particles and the present exfoliated perlite particles is visually clear by comparing Figure 3 (exfoliated perlite) with Figure 2 (normal expanded perlite) and Figure 4 (exfoliated perlite) with Figure 5 (normal expanded perlite), as discussed in the present specification at page 37, line 21 to page 38, line 14.

In contrast to the presently claimed invention, neither Pierce nor Burkett disclose or suggest a controlled release agricultural absorbent based product employing exfoliated perlite particles (as recited, for example, in presently considered independent claims 63 and 69).

Furthermore, neither Pierce nor Burkett disclose or suggest a process for preparing a controlled release agricultural absorbent based product employing a step of producing exfoliated perlite particles (as recited, for example, in presently considered independent claim 201).

The presently claimed product, as set forth for example in independent claims 35, 59, 63, 69 and 202, recites a controlled release agricultural absorbent based product that includes particles of an absorbent material containing capillaries/voids, which is impregnated with an agriculturally beneficial material (i.e., fertilizers, insecticides, herbicides and/or fungicides) mixed with an interspatial blocker material. In claim 202, the blocker material is selected from a group of recited, appropriate blocker materials. In claim 69, the blocker material is specifically vegetable starch.

As mentioned above, Pierce teaches agriculturally active materials suspended in a holding material, which is coated onto and impregnated into the microscopically

irregular and porous surfaces of expanded perlite particles, whereby the active and holding materials are retained on the perlite particles. Pierce is concerned with a coating that is tightly held to the surface of the particles. Accordingly, Pierce teaches a coating which impregnates the pores at the surface of the expanded perlite particles and which fills the pores of the particles that communicate with the surface of the particles, thus resulting in particles that tightly retain a large quantity of active material on the particles' surface (see column 2, lines 57-59; further see column 2, lines 3-11 and column 2, lines 33-34). Pierce's "holding material" accordingly serves to hold the active material at or near the surface of the particles. The small amount of surface impregnation is clearly evident in Pierce's Figures 3 and 4 (please note that only the left-downward crosshatching shows embedded holding material). Pierce points out, "However, the general manner in which the coating permeates the surface-exposed pores, but is excluded from the sealed internal bubble cells is shown in Figure 3." (see column 17, lines 2-5)

Indeed, Pierce's process for preparing expanded perlite includes the unusual step of preheating the raw (unexpanded) perlite to remove some water, prior to the step of heating the perlite to generate steam to expand the raw perlite, as disclosed at column 3, lines 49-67. Pierce's process thus suppresses the expansion of the perlite particles and retains a large number of sealed internal cells that can not be impregnated with the mixture of holding and active materials.

Accordingly, Pierce's "holding material" serves to hold the active material at or near the surface of the particles.

In contrast, the interspatial blocking material that is mixed with the agriculturally beneficial material of the presently claimed invention limits access of moisture to the beneficial material by blocking the pores/voids of the deeply impregnated absorbent material.

The cited reference of Burkett only teaches the impregnation of soluble, fertilizer, chemical compounds and does not disclose or suggest any type of interspatial blocker.

Additionally, please note that Pierce's holding materials are (1) an inert soluble cellulose such as methyl cellulose, (2) finely ground lignite, (3) dehydrated, ground and steamed sea kelp, (4) activated sewage sludge and (5) sulfide paper pulp liquor, as disclosed at column 6, line 20 to column 7, line 21. In contrast, the specific interspatial blocker materials recited in present claims 69 and 202 do not include nor are suggested by the holding materials of Pierce.

Thus, the applicants submit that the interspatial blocker of the presently claimed invention is no where disclosed, suggested or made obvious by the combined teachings of Pierce and Burkett.

The presently claimed product, as set forth for example in independent claim 99, recites a controlled release agricultural product that includes a mixture of an agriculturally beneficial material (fertilizers, insecticides, herbicides and fungicides) and a control release holding substance selected from the group consisting of plant starches, protein gels, glues, gumming compositions, crystallizing compounds, gelling clays and synthetic gel forming compounds, wherein the product is in a particulate form.

This claimed product does not include any type of absorbent particles. This product provides for a faster release of the beneficial material than the other embodiments of the present invention (see Examples 12, 13, 20 and 21 of the present specification).

Both Pierce and Burkett disclose products that are fundamentally and inseparably based upon the required particles of perlite. The product of the present invention as recited for example in claim 99 does not include such any such component and is fundamentally different from the Pierce and Burkett products.

Accordingly, the applicants submit that the presently claimed invention as recited for example in claim 99, is no where disclosed, suggested or made obvious by the teachings of Pierce and Burkett.

Embodiments of the process of the presently claimed invention, as recited for example in claims 123 and 148, include steps of agglomerating absorbent particles into granules. As thoroughly discussed above, the processes of both Pierce and Burkett result in individual active perlite particles and in no manner contemplate steps of agglomerating absorbent particles into granules.

Pierce's manufacturing process shows that larger and fine particles are deposited in storage chambers as disclosed at column 13, line 44 to column 14, line 9 and disclosed at column 16, lines 17-35. As taught at column 16, lines 34 -39, during production of larger coated particles, fine coated particles are conveyed by hot air to a cyclone so that the fines may be dropped into device for compressing the coated fine particles into tablets or pellets. By an incidentally described and completely separate

process, inert, carrier expanded perlite particles may be mixed with holding material and active material and this mixture is formed into tablets or pellets (see column 16, lines 59-54). While virtually nothing is described about this separate process, the expanded perlite particles are not coated (i.e., they are "inert") and appear to simply provide structural support to the formed tablets or pellets of mixed holding material and active material.

In contrast to the process of Pierce, the process of the presently claimed invention includes the step of agglomerating individual impregnated absorbent particles into granules. Excess agriculturally beneficial material with or without interspatial blocker material on the outside of the particles helps the individual impregnated particles to adhere into granules. When there is no interspatial blocker material in the desired product, the manufacturing process (e.g. claim 123) includes the step of granulating the combination of agriculturally beneficial material and absorbed particles to solidify and harden the mixture within the absorbent particles and outside the particles, resulting in the agglomeration of absorbent particles into granules. When there is an interspatial blocker material in the desired product, the manufacturing process (e.g. claim 148) includes the step of granulating the combination of agriculturally beneficial material, interspatial blocker and absorbed particles to solidify and harden the mixture within the absorbent particles and outside the particles, resulting in the agglomeration of absorbent particles into granules (see for example, page 37, lines 17-22; page 40, lines 10-12; and page 16, line 20 to page 17, line 1).

Pierce does not disclose or suggest the step of agglomerating individual impregnated absorbent particles into granules.

The teachings of Burkett do not remedy the deficiencies of Pierce.

Burkett discloses a manufacturing process which includes the absorption by expanded perlite of a solution of fertilizer chemicals and then drying the perlite to leave the chemical salts within the cells of the perlite (see column 3, lines 2-18) and thus yield dried, active perlite particles as a product.

Neither Pierce nor Burkett disclose or suggest the step of agglomerating impregnated absorbent particles into granules.

Thus, the applicants submit that the presently claimed process is fully allowable under Section 103(a) in view of the cited references.

An embodiment of the process of the presently claimed invention, as recited for example in claim 185, recites steps for preparing a controlled release agricultural product that does not include any type of absorbent particles. The process includes steps of mixing a control release holding substance with an agriculturally beneficial material, granulating the combination of agriculturally beneficial material and holding substance to solidify and harden the mixture, resulting in granules, and drying the granules (see Examples 12, 13, 20 and 21 of the present specification).

Both Pierce and Burkett disclose process steps that are fundamentally and inseparably based upon the production of individual particles of active perlite. The process of the present invention as recited for example in claim 185, does not include

any such perlite related process steps, and is fundamentally different from the Pierce and Burkett processes.

Accordingly, the presently claimed invention is no where disclosed, suggested or made obvious by the teachings of the cited references. The presently claimed invention is fully allowable under Section 103(a).

In view of the above, it is believed that the present application is in condition for allowance and a Notice to that effect is respectfully requested.

Respectfully submitted,

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